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ABSTRACT

This report outlines progress made during the third year of the “ **Preventing the consequences of alcohol abuse: Identification of soldiers at high risk for fatal and serious injuries**” research project. The main goal of this study is to improve our understanding of the relationship between alcohol problems and risk of serious injury. Specifically, this study seeks to document the prevalence of injury-related diagnoses among soldiers admitted to the hospital with and without alcohol-related comorbidities, and to ascertain the relationship between alcohol-related diagnoses and risk for subsequent re-injury or other adverse injury outcomes (e.g., death, disability). This project relies on the use of secondary health and administrative data. Addressing challenges related to incomplete, missing and miscoded data have been a major priority for this research project. Changes in the management of healthcare throughout the 1990s and concurrent change to TRICARE have affected healthcare use patterns as well as data archiving and accessibility. Researchers must use caution when using and interpreting data maintained in administrative military hospital databases. Preliminary findings indicate that rates for Army alcohol-related hospitalizations were higher than civilian rates through most of the 1980s; this trend began to reverse in the early 1990s. Such trends seem to correlate with changes in military and civilian alcohol policies throughout the 1980s and early 1990s. Over this same time period, soldiers referred for evaluation of potential alcohol-related problems to the Army’s substance abuse program were significantly more likely be white, male, young (18-25), of lower rank (E1-E4) and were less well-educated than the military population as a whole. Future work will continue to examine the epidemiology of both alcohol- and injury-related conditions using both hospitalization and substance abuse treatment databases.

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INTRODUCTION

This report outlines progress made during the third year of the “ **Preventing the consequences of alcohol abuse: Identification of soldiers at high risk for fatal and serious injuries**” research project. The main goal of this study is to improve our understanding of the relationship between alcohol problems and risk of serious injury or re-injury. Specifically, this study will document the prevalence of injury-related diagnoses among soldiers admitted to the hospital with and without alcohol-related comorbidities, and ascertain the relationship between alcohol-related diagnoses and risk for subsequent re-injury or other adverse injury outcomes (e.g., death, disability). We will also document patterns of injury (e.g., by major cause or mechanism) associated with different types of alcohol-related diagnoses (e.g., acute intoxication, chronic abuse/dependence). We will also examine risk of severe injury among soldiers enrolled in the Army's alcohol abuse treatment program.

BACKGROUND

Injuries were the fourth leading cause of death among the total U.S. population from 1999 to 2002, and the leading cause of death for 1-44 year olds (4). The largely young, male demographic composition of the military makes it an organization particularly at risk for these problems. Among active duty Army soldiers, injury is a leading cause of death and lost work days (9, 21, 23, 25). The 2002 Department of Defense (DoD) Survey of Health Related Behaviors Among Military Personnel (13) found that rates of injury hospitalizations for military personnel were approximately 500 per 10,000 population, far higher than the civilian rate of about 64 per 10,000 recently estimated by the Centers for Disease Control and Prevention (CDC) (22) and 5 times higher than the Healthy People 2000 target. Other published studies also indicate that military personnel are at increased risk for injuries as compared to age and gender matched civilians (5, 13).

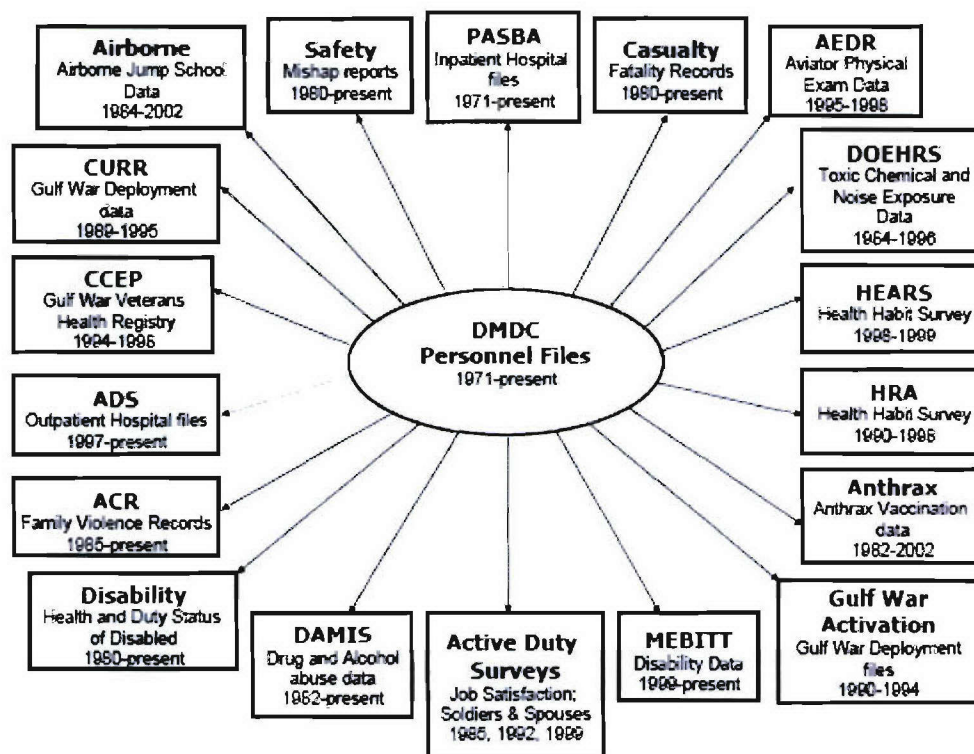
Alcohol abuse has been associated with increased risk for virtually every type of injury (10, 11, 18, 26, 27). Military populations may be particularly vulnerable to alcohol-associated injuries. Bray and others have shown that military populations are more likely to engage in high risk drinking than civilians, especially for 18-25 years olds, where prevalence of heavy drinking was about 2 times greater than similarly-aged non-military individuals (13, 20)..

Understanding and quantifying the relationship between drinking behaviors and injury among military personnel is a priority for research and prevention activities. The Department of Defense (DoD) has identified injuries and alcohol abuse as two of the top three targeted areas for health promotion and preventive care research (2). It is particularly important to identify risk factors and prevention options for reducing serious injuries, such as those that result in death or hospitalization. Recent studies have examined emergency room trauma and the effects of alcohol on injury, both in the U.S. and internationally (12, 16, 17, 24). Alcohol is often a secondary condition diagnosed during treatment of trauma but it is not clear whether or not the underlying alcohol-related problem receives treatment beyond the emergency room. More data are

needed to clarify how alcohol-related injuries differ from injuries that do not involve alcohol in terms of additional associated risk factors, treatment, and long-term outcomes, including risk for re-injury, additional injury hospitalizations or injury deaths. This project focuses on clarifying these relationships.

This research draws upon data from the Total Army Injury Health Outcomes Database (TAIHOD) (8, 9). Established at the U.S. Army Research Institute of Environmental Medicine (USARIEM) in 1994 to specifically examine the impact of injury and disability outcomes among U.S. Army soldiers, the TAIHOD now contains electronic records for all soldiers who have been on active duty since 1971 (approximately 5 million individuals). These data sources, which are linked at the level of the individual soldier, contain information on demographic and occupational characteristics including job type, discharge from the Army and reason for separation, inpatient and outpatient health care utilization, and other health outcomes and conditions such as deaths, disabilities and treatment for alcohol or drug-related problems (see Figure 1). (**Note:** This figure differs from a similar figure that appears in our 2004 report due to recent updates in the TAIHOD).

Figure 1. Components of the updated Total Army Injury Health Outcomes Database (TAIHOD)



PROGRESS RELATED TO STATEMENT OF WORK (SOW) OBJECTIVES IN YEAR 3 OF PROJECT

As outlined in a No-Cost Extension submitted to USAMRAA on 25 May 2005, and approved grant modification (28 June 2005), we have amended our SOW and reporting schedule. None of the content from our original SOW has been changed. This report will document all new progress during the July 1, 2004 – June 31, 2005 reporting period on all relevant SOW objectives. Despite some of our data-related setbacks, we have still made significant progress towards many of our SOW tasks. Progress is detailed below along with a summary chart noting status of activities and progress towards completing specific SOW tasks (see p. 24).

I. Database Construction, Exploration and Additions

A. Missing TRICARE Records

In order to measure and evaluate associations between injury- and alcohol-related hospitalizations we must accurately capture prevalence and incidence rates of these hospitalizations. In our initial exploration of the data, prior to submitting our study proposal, we identified a secular decreasing trend in alcohol-related hospitalization rates over time, with a precipitous decline beginning around 1996 (REF: SSDS Grant DAMD17-01-0-0676, p. 20). In the proposal we hypothesized that the decline may have been related to the changing trends in the medical management of alcohol problems such that more were treated in an outpatient setting. We hoped to account for these differences by accessing outpatient data. However, through data exploration and interviews with various database administrators, we have learned that the apparent decline in hospitalizations for alcohol is only partially explained by increased referral to outpatient treatment settings. After extensive exploration we now know that some of the apparent decline in hospitalization rates is due to changes in the management of alcohol-related conditions, some is due to changes in the entire Army medical care system, as well as associated changes in hospital record administration, and some is due to idiosyncrasies of caring for soldiers during deployments and record-keeping glitches.

The advent of TRICARE in the mid 1990s resulted in the outsourcing of some inpatient and outpatient care to civilian treatment centers for many military personnel. Prior to 1996, TAIHOD was able to acquire relatively complete medical records for soldiers treated outside of a military treatment facility (MTF) through Patient Administration Systems and Biostatistics Activity (PASBA), our TAIHOD hospital data source. Unfortunately, the system of record maintenance instituted by TRICARE does not capture civilian hospitalizations in the same manner as the previous DoD healthcare system. Thus, we have learned that hospital records for soldiers treated outside a MTF after the switch to TRICARE are not always included in our existing hospitalization files from PASBA.

It is not clear how extensive the missing records are nor whether there is a pattern such that certain hospitalizations are more or less likely to occur in civilian facilities. However, the consequences of basing analyses on incomplete data are

profound. Over the past year, much effort has been put into assessing the scope and depth of this problem and also to try and secure access to these missing outsourced records. Progress, in an era of increasing concerns about the use of large databases and protecting confidentiality, has been slow. Through investigation and a long process of inquiry, we have learned that the only way to obtain the missing records for care received outside military facilities is to apply for multiple accounts within the Military Health System's (MHS) Executive Information and Decision Support (EI/DS) Portal and with the MHS Data Repository (MDR). Access to this portal and to the MDR will allow us to obtain all hospitalization data beyond 1996. Due to the sensitive information requested, the nature of MHS data management, and the unique relationship between SSDS and the TAIHOD database, account clearance has taken an unusually long period of time. It required internal clearance at the TAIHOD and USARIEM, with EI/DS and with the TRICARE Management Activity Privacy Office, and we have only recently been granted permission to access some of these files. SSDS programmers have downloaded the software provided to access some elements of the database and have begun sorting and cleaning the accessible data and linking it to the rest of the TAIHOD. We expect to receive approval and access to the rest of the data later this month and will hopefully have access to all missing data by September 2005.

B. Missing Transfer Hospitalization Records

In addition to extensive work to quantify and describe missing data and to obtain access to these missing hospital records, we have spent considerable time consulting with PASBA and exploring existing TAIHOD hospital records in order to improve our ability to distinguish between unique hospital events and hospital records created when a person is transferred to a new hospital in order to continue care for an existing condition. Our commitment to properly identifying transfer cases is not simply for our own analyses. Many other researchers use the same hospital administrative database from PASBA for their own research. Since our last annual report, we have refined our method for calculating episodes of care based upon consultation with our PASBA contact and extensive review of hospital data. In our original analyses of hospital transfers using diagnoses and PASBA hospital transfer codes (REF: 2004 Annual Report), we identified some cases in which the transfer codes were incomplete – for example, an initial hospital record might indicate a transfer out of the facility to another facility had occurred (“transfer out” code) but the individual’s next consecutive hospital record did not have a “transfer in” code. We initially believed that these incomplete codes were administrative errors, a common problem in secondary data analysis. However, careful review of the data and correspondence with our contacts at PASBA revealed that, while some of the missing data may in fact be missing due to administrative oversight or error and some could be attributed to the advent of TRICARE discussed previously, another portion of the incomplete transfer data could be explained by missing records related to treatment of a soldier in a non-Army medical facility. Through exploration and investigation we learned that when an Army soldier was transferred to or from non-Army military facilities as happens more commonly during training missions or deployments their medical records were sometimes missing from the PASBA database. So, in parallel with our effort obtain missing TRICARE data,

we have also worked with our PASBA contacts to locate and gain access to missing data for treatment occurring in non-Army military hospital facilities in order to more accurately calculate the true incidence of injury and disease in the Army population.

In May of 2005, we obtained the file containing these missing military data for Army soldiers treated at Air force or Navy facilities from FY1989-FY2002. After our programmers cleaned and linked the data to the TAIHOD, we were able to add 117,655 active duty Army hospitalization records to the TAIHOD hospital files. The addition of these missing records improves the completeness of hospitalization data. It will also allow us to more accurately assess injury and alcohol hospitalization rates and better characterize hospital records as unique events versus records produced during a hospital transfer.

It is important to note that these efforts at completing the Army hospital data are crucial to the accurate recording and counting of not just injury and alcohol hospitalization rates, but also hospitalization rates for a wide range of other conditions. While such data cleaning efforts are perhaps the least glamorous element of epidemiology, they may be the most important, and overlooked, step in properly conducting a study such as this. It is not clear whether other researchers using Army data have taken these steps. As such, the results from these efforts will not only improve our understanding of alcohol and injury hospitalizations but also may result in the need to review findings of other published studies that have not taken into account extensive missing hospitalization data.

C. Database Development and Exploration of New Data Files

As most of our delays in completing specific SOW objectives have been due to discovering, identifying, and acquiring the missing hospitalization data, we have moved forward with our use of alternative databases not affected by these incomplete observations.

Drug and Alcohol Management System Database (DAMIS)

This year, we have explored the Drug and Alcohol Management and Information System (DAMIS) database. Analysis of the DAMIS was not originally part of this study but was added when the data became available in 2004¹. This database houses information on all Army soldiers referred to and/or treated within the Army Substance Abuse Program (ASAP) as well as results from urinalysis testing resulting from random or directed drug screening. The database also includes intake files for individuals who were referred to the ASAP for an evaluation and progress reports for those ultimately enrolled in the program for treatment of alcohol or drug-related problems. These files are particularly useful for study of alcohol problems because the population included in the datafile is so large and the file includes information not only on referral to the ASAP program (potential alcohol problem) but also data on mechanism for referral (case finding method), diagnosis, and subsequent treatment. Diagnoses are recorded in the

¹ The Human Use Review Committee at USARIEM approved an amendment to our research protocol allowing us to obtain and use DAMIS data on September 11, 2003. This amendment was referenced, and a copy provided, in our 2004 Annual Report.

DAMIS database according to the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) and also are distinguishable by an "enrollment reason" variable which denotes the type of substance abuse resulting in the referral. We have matched the DAMIS files to the Defense Manpower Data Center (DMDC) personnel files in order to examine demographic characteristics related to enrollment, treatment and re-enrollment (potentially a marker for failed treatment or severity of abuse). We will also use the DAMIS database for several other future projects under this grant.

Pay and Compensation Files

Considerable effort has been put into updating and cleaning TAIHOD compensation ("Pay") files. These files hold information through 2002 on both regular pay, special bonuses such as pay for exposure to hazardous duty, and military housing allowances for active duty Army soldiers. These pay files have been used to explore the association between receipt of hazardous duty pay (marker for risk exposure and risk-taking behaviors) and adverse outcomes (e.g., severe domestic violence). The pay files will also allow us to more accurately control for differences in the socio-economic status of soldiers.

Army Discharge (Loss) Files

Our Army discharge ("Loss") files have also been updated this past year and are now current through 2003. These files, which contain data on discharge circumstances (reason for and type of discharge) as well as date of discharge, have been incorporated into the TAIHOD and now can be linked to all other existing databases. The accurate recording of loss data is crucial to the determination of rates (population denominators) and in assessing risk for discharge from the Army.

Army Deaths (Casualties) Files

The updated casualty records will be used in our analysis of risk for injury-related death subsequent to alcohol diagnosis in the DAMIS and in hospital records.

*Related Tasks: SSDS SOW 2
SSDS SOW 3
SSDS SOW 9*

II. Episode of Care Research

Though we are still waiting to receive the missing TRICARE hospital files which will be used in the final models assessing hospital transfers, the additional data on non-Army military hospitalizations, along with other information from our PASBA contacts, such as the strength of the treatment facility codes, have led us to revamp our methodology for this paper. In addition to the transfer codes, we will also utilize codes indicating treatment facility. Based upon our review of outliers, patients transferred from overseas locations and correspondence with our PASBA contact, we have also restricted our analyses to contiguous pairs of hospitalizations with admission dates within 14 days of each other. Transfers will be identified and defined as such based upon the presence of complete transfer codes in both records, matching facility codes,

and a match between broad ICD diagnostic codes (primary diagnosis in the first hospitalization is present in any diagnostic position in the second hospitalization). Consecutive hospitalizations that do not meet these criteria will be considered unique events. We have also extended our work to include all ICD-9-CM broad diagnostic groups as opposed to just injury- or alcohol-related conditions, in order to more thoroughly evaluate condition-specific differences in time between transfer hospitalizations. This will make our work relevant to a much wider audience and demonstrate how accounting for episodes of care may affect their study results.

Criteria for eligibility as a unique episode of care	Hospitalization Pairs
<ul style="list-style-type: none"> Two consecutive hospitalizations for the same individual 	N = 197,274
<ul style="list-style-type: none"> First hospital record contains a “transfer out” code and the second hospital record contains a “transfer in” code 	N = 6,578
<ul style="list-style-type: none"> First hospital record contains a “facility to” code and the second hospital record contains a “facility from” code where the facility codes match the information from the corresponding hospitalizations 	N = 4,052
<ul style="list-style-type: none"> Time between discharge date from the first and admission date for the second hospitalization is 14 days or less 	N = 3,625
<ul style="list-style-type: none"> The primary diagnosis in the first hospitalization is present in any position in the second hospitalization 	N = 2,464

While waiting to receive complete TRICARE data, we have begun exploring hospital data for 1990-1995 (the time period not affected by TRICARE lost records). Using the process described above to identify transfer hospital records, we have identified 2,464 pairs of known transfers for all hospitalizations (the first two hospital records of a sequence of transferred hospitalizations). We also explored variations in lag time between first and second hospital record across diagnostic groups (Table 1). Table 1 shows the mean number of days between discharge from the first hospitalization to the admission date of the subsequent (transfer) hospitalization. The average length of time between discharge of the first hospitalization and admission to the second was 1.76 days. Conditions such as complications of childbirth, diseases of nervous and circulatory system and injuries tended to have shorter time between hospitalizations, while musculoskeletal conditions and diseases related to endocrine and skin disorders tended to have longer lag times between hospitalizations. This suggests that a single algorithm using days between records, as has been done in some civilian studies to try and avoid overcounting hospitalizations, may not be appropriate without consideration of diagnosis. However, since treatment patterns change over time, these results should be considered preliminary and it would not be prudent to apply this information to any studies using hospital data after 1995. Once we have TRICARE data we will explore lag time associations between hospital transfer-related records by diagnostic group to assess the robustness of findings from the 1990-1995 time period and the relevance of our preliminary results to more current hospital data.

Table 1. Mean number of days between discharge from first hospitalization to admission to second (transfer) hospitalization for U.S. Army soldiers, 1990-1995.

ICD Major Diagnostic Category	N (Hospitalization Pairs)	Mean Days	Standard Deviation	Minimum	Maximum
001 – 139 Infectious and Parasitic Diseases	40	1.55	1.87	0	8
140 – 239 Neoplasms	76	2.07	2.91	0	14
240 – 279 Endocrine, Nutritional and Metabolic Diseases, Immunity Disorders	20	2.30	3.37	0	13
280-289 Diseases of the blood and Blood-forming Organs	6	0.67	1.21	0	3
290 – 319 Mental Disorders	841	1.88	2.48	0	14
320 – 289 Diseases of the Nervous System and Sense Organs	101	1.32	2.14	0	13
390 – 459 Diseases of the Circulatory System	130	1.41	2.28	0	11
460 – 519 Diseases of the Respiratory System	51	1.47	2.64	0	13
520 – 579 Diseases of the Digestive System	59	1.71	2.98	0	14
580 – 629 Diseases of the Genitourinary System	61	1.59	1.99	0	9
630 – 676 Complications of Pregnancy, Childbirth and the Puerperium	91	0.48	1.49	0	11
680 – 709 Diseases of the Skin and Subcutaneous Tissue	25	3.04	2.96	0	11
710 – 739 Diseases of the Musculoskeletal System and Connective Tissue	352	2.15	2.58	0	14
740 – 759 Congenital Anomalies	4	4.50	5.07	1	12
760 – 779 Certain Conditions Originating in the Perinatal Period	0	--	--	--	--
780 – 799 Symptoms, Signs and Ill-defined Conditions	53	1.87	2.90	0	14
800 – 999 Injury and Poisoning	479	1.46	2.13	0	14
Supplemental Classification (E-Codes and V-Codes)	75	2.72	2.71	0	14

Total	2,464	1.76	2.45	0	14
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Related Tasks: SSDS SOW 2
SSDS SOW 3
SSDS SOW 4
SSDS SOW 5

III. Military and Civilian Comparison

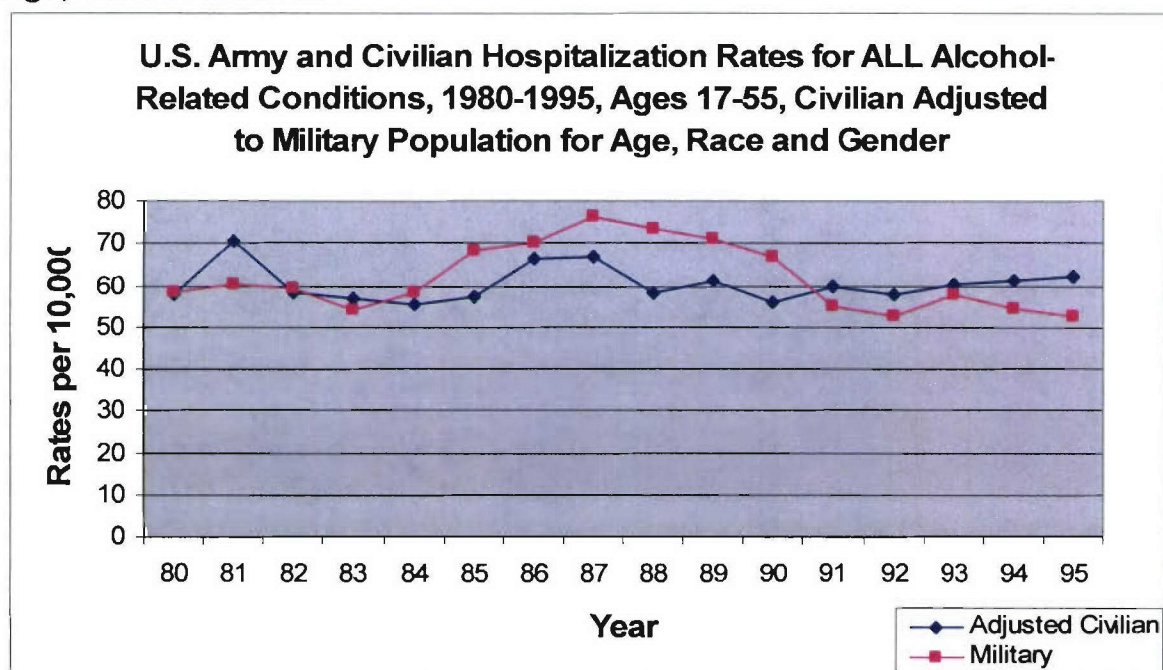
Much progress has been made on our paper titled, "Comparison of Military and civilian Alcohol Diagnoses, 1980-1995." This study compares the rates of alcohol-related Army hospitalizations occurring between January 1, 1980 and December 31, 1995 for both the U.S. Army and civilian populations. The paper includes analyses of hospitalizations where alcohol is a primary or a secondary diagnosis. Using the National Hospital Discharge Survey (NHDS) for non-military hospitalizations, civilian-Army comparisons are reported for rates of overall and diagnosis-specific alcohol-related hospitalizations over the study period.

This paper was originally a component of a manuscript that addressed trends in alcohol-related hospitalizations, demographic attributes of this population, and challenges involved with isolating unique hospital records from those produced when a patient was transferred to another facility for continued treatment. However, results from comparisons of military and civilian alcohol inpatient hospitalization trends are detailed and intriguing enough to warrant their presentation in a separate paper. This decision increases the number of products we will produce and also allows us to explore variations in hospitalization patterns over time for specific types of alcohol-related conditions. This has important implications for evaluation of alcohol policy and treatment programs.

The NHDS civilian data does not account for transfers of care; therefore, for comparative reasons, we did not adjust the Army hospital records for transfers. This study examines trends in different types of alcohol abuse between military and civilian populations from 1980-1995. Army-specific and ICD-9-CM related variations in the coding of alcohol-related diagnosis over this time period required the development of a crosswalk in order to accurately evaluate trends in alcohol-related hospitalizations. The crosswalk was described in last year's report but, for reference purposes, has been attached to this report as well since it was a crucial element of the military-civilian hospitalization comparison (see Appendix A).

Because the Army is younger, and has a greater proportion of male and minority members than the civilian population at large, we adjusted the civilian hospitalization data to the Army data along these demographic characteristics. Figure 2 displays the differences in rates for all drinking-related diagnoses between the two groups. Rates for the military were higher than civilian rates for most of the 1980s, but began to shift downward in the latter half of the decade, falling below rates of civilian alcohol-related hospitalizations in 1991 (See Figure 2).

Figure 2. U.S. Army and Civilian Hospitalization Rates for ALL Alcohol-related conditions, 1980-1995, Ages 17-55, Civilian Adjusted to Military Population for Age, Race and Gender.

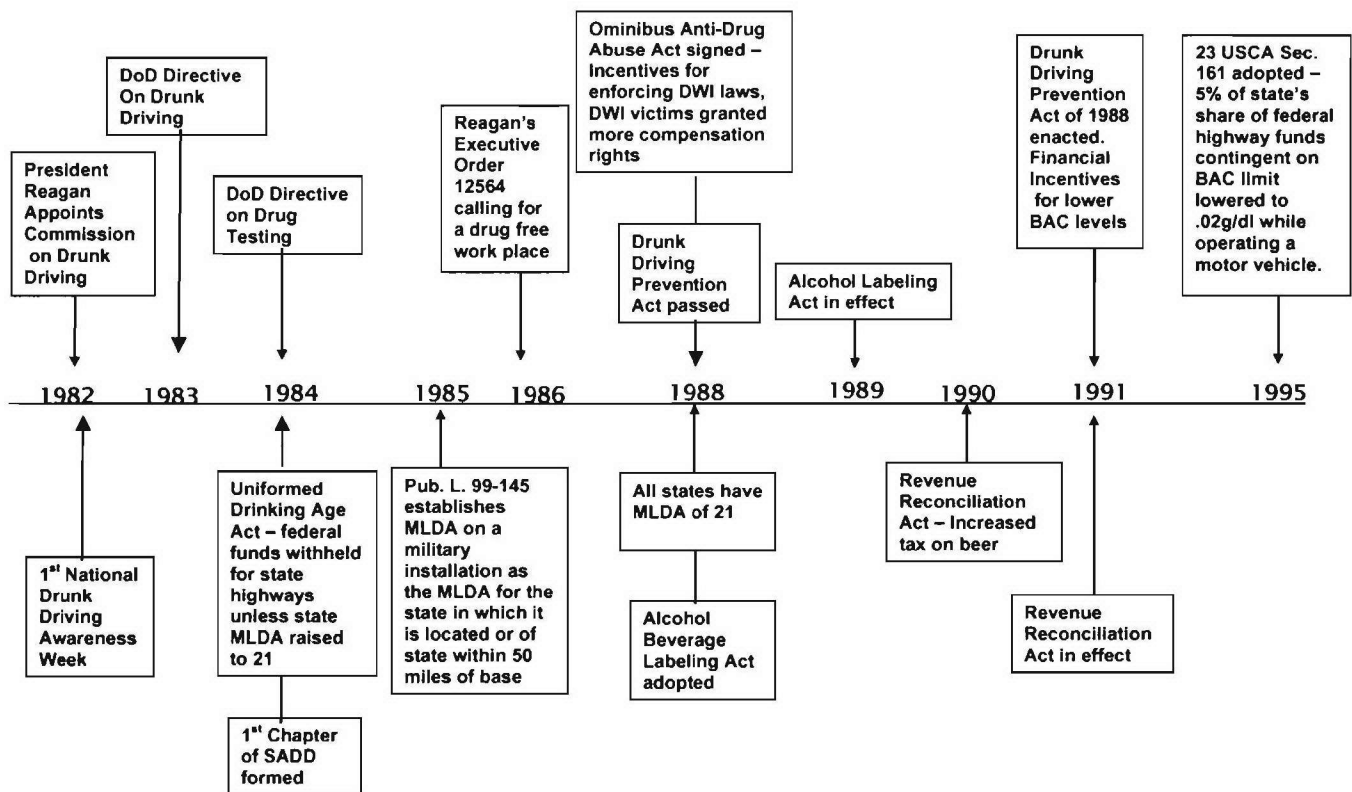


Changes in alcohol-related hospitalization patterns over time may result from changes in actual drinking practices related to social, political and cultural or normative changes around drinking; changes in the demographic composition of the underlying population; or may reflect changes in the detection and treatment of alcohol-related conditions. During the study time period there were a number of changes in alcohol-related policies and norms as reflected in the adoption of many laws and regulations affecting alcohol use. Figure 3 displays some of these changes reflecting the variations in the sociopolitical climate during the study period and related modifications of military and civilian alcohol-related policy. The gradual transition to increase the minimum legal drinking age (MLDA) from 18 or 19 to 21 in the mid-80s is probably also a contributing factor, as is the increasing influence of grassroots organizations, such as Mothers Against Drunk Driving (MADD). A string of other alcohol-related civilian policies such as lowering the legal blood alcohol levels for driving and raising fines and penalties for serving alcohol to minors likely had some influence on drinking behaviors and thus alcohol-related hospitalizations. Additionally, the advent of managed care and changes in treatment philosophy may have resulted in fewer inpatient hospitalizations for alcohol-related conditions.

It is possible that increased surveillance for drugs and alcohol abuse in the Army and increased or improved treatment programs helped reduce some of the serious consequences of alcohol abuse resulting in fewer Army hospitalizations. Better pre-induction screening may have resulted in fewer soldiers entering the Army with alcohol

and/or drug abuse problems. It also may be that, over time and with societal or Army cultural changes in drinking norms, there was less tolerance for abuse, resulting in more alcohol-related early discharges from the Army and fewer soldiers in need of inpatient care. Together with the concomitant changes in civilian alcohol-related behaviors and policies, therefore, the normative culture around drinking behaviors in the Army began to shift (13). The following timeline (Figure 3) illustrates some of the major movements in alcohol policy in both the military and civilian world.

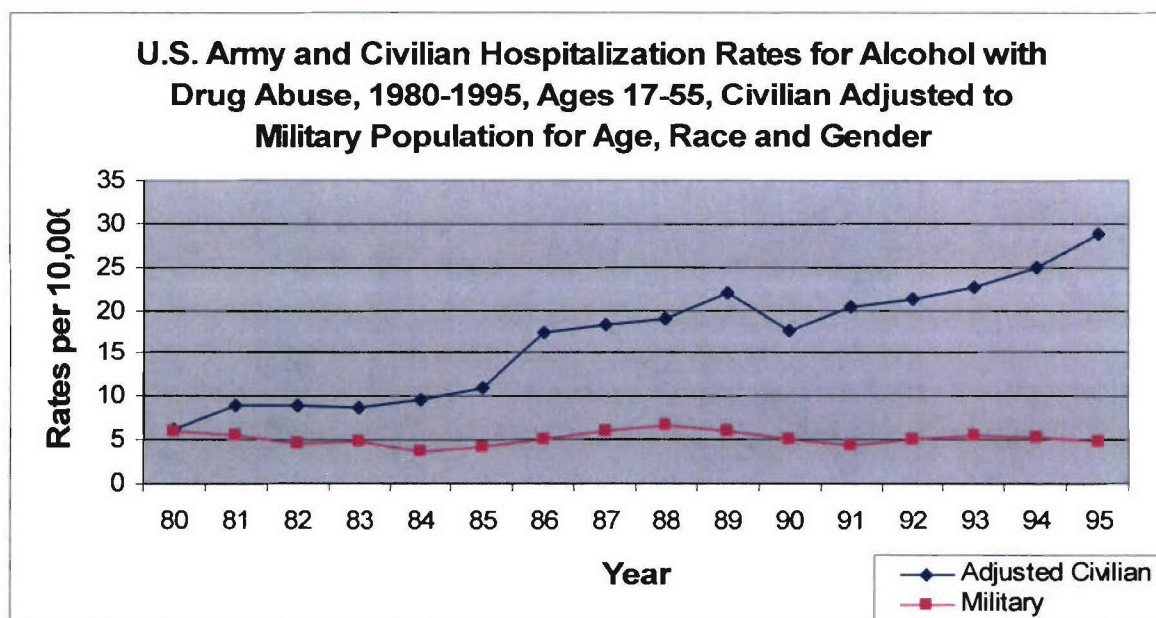
Figure 3. Alcohol Policies in the Military and Civilian World, 1980-1995.



While the Army hospitalization rates for all alcohol conditions have decreased to levels lower than that found in the civilian population, patterns vary by type of alcohol-related disorder. Army rates for conditions related to more serious alcohol problems such as chronic, long-term abuse (e.g., liver problems, alcohol-related psychosis) or alcohol problems that occur in conjunction with drug abuse have been consistently much lower than those observed for civilians, even after demographic differences in the two populations, such as age, were accounted for. This may be due to a combination of factors, including pre-enlistment screening for substance abuse and mental health

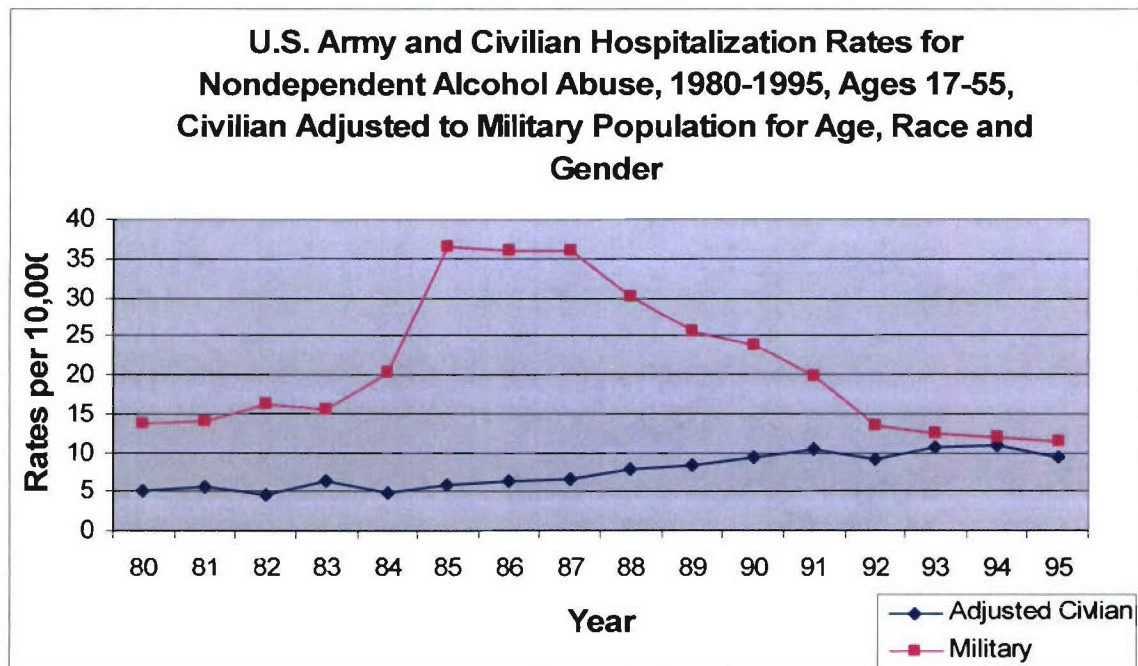
disorders, low tolerance of severe substance abuse in the military, and other health or legal problems that would render those with chronic substance abuse problems unfit for military service. The military-civilian differences in rates of hospitalization for polyabuse disorders are particularly striking, with civilian rates rising from 6.2 cases per 10,000 population in 1980 to nearly 29 per 10,000 in 1995. Army rates of polyabuse hospitalizations for the same years were almost unchanged, going from 5.9 cases per 10,000 soldiers in 1980 to 4.9 per 10,000 in 1995 (Figure 4).

Figure 4. U.S. Army and Civilian Hospitalization Rates for Alcohol with Drug Abuse, 1980-1995, Ages 17-55, Civilian Adjusted to Military Population for Age, Race and Gender.



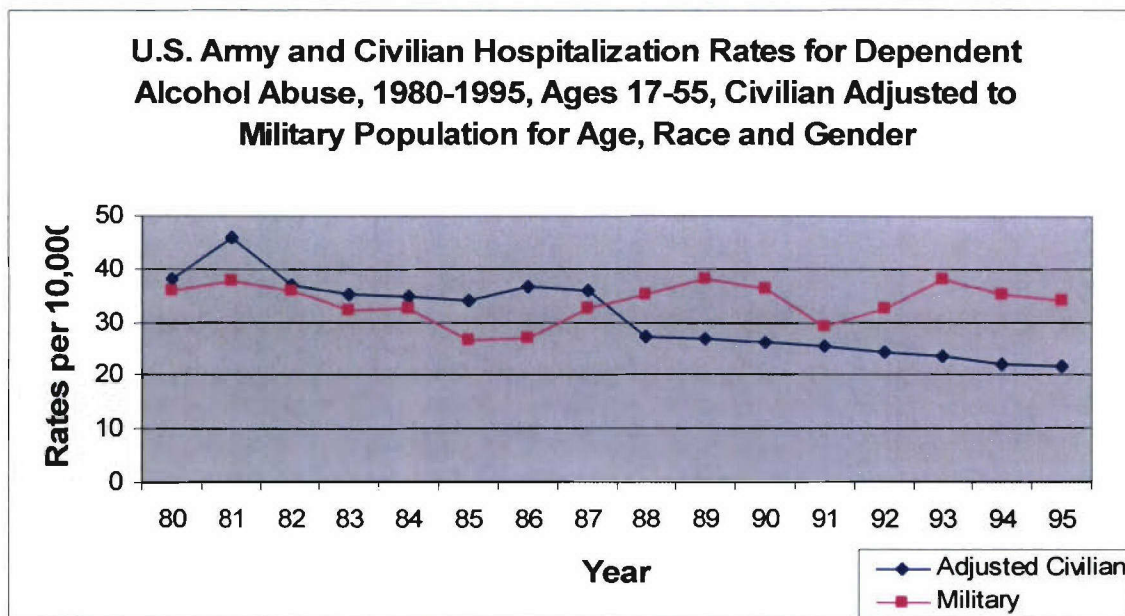
Army rates for nondependent alcohol abuse have historically been higher than civilian rates. But, by 1988, military rates for nondependent alcohol abuse began to decline, with rates becoming almost identical to civilian hospitalization rates by 1994 (Figure 5). This may be related to real changes in the health of soldiers as described above, as well as demographic shifts in the Army population (older, more females). Variations in diagnostic coding conventions may also play a role here. Changes in the minimum legal drinking age referenced above in Figure 3 also likely account for a large portion of this trend. Between 1984 and 1988, all U.S. states raised the minimum legal drinking age to 21 (28). As a result, one would expect counts of non-dependent drinking - which may be more episodic and are more common among younger drinkers - to fall as the laws were in place to reduce, and penalize, underage drinking. It should be noted that, in 1984, the DoD instituted a very rigorous drug detection policy. Others (14, 19, 29) have noted a "substitution effect" where a more-available substance is substituted for a newly restricted one. It is possible that, until policies and norms sufficiently changed the propensity to drink heavily, those who otherwise would have engaged in illicit drug use switched to alcohol abuse.

Figure 5. U.S. Army and Civilian Hospitalization Rates for Nondependent Alcohol Abuse, 1980-1995, Ages 17-55, Civilian Adjusted to Military Population for Age, Race and Gender.



Army rates for dependent alcohol abuse hospitalizations have historically been slightly lower than civilian rates (Figure 6). However, the trend appears to be reversing in the late 1980s with military rates for dependent alcohol abuse hospitalizations higher than civilian rates. In addition, while there appears to be a slow secular downward trend in alcohol-dependent abuse hospitalizations in the civilian sector, rates are stable or even possibly increasing among Army soldiers. The etiology of this is unclear. It may be that alcohol-dependent Army soldiers are more likely to be hospitalized while civilians with the same conditions are increasingly likely to be treated in an outpatient setting.

Figure 6. U.S. Army and Civilian Hospitalization Rates for Dependent Alcohol Abuse, 1980-1995, Ages 17-55, Civilian Adjusted to Military Population for Age, Race and Gender.



Related Tasks: SSDS SOW 4
SSDS SOW 5

IV. Drug and Alcohol Management Information System DAMIS Alcohol Cases

We have made considerable progress on a paper describing the characteristics of soldiers who are referred to the Army Substance Abuse Program (ASAP) for an alcohol evaluation. We were able not only to characterize those who are referred but also identified demographic differences associated with variations in referral pathways as well as demographic characteristics of soldiers ultimately enrolled for treatment. Subsequent evaluations and second enrollments (repeat alcohol events) are also described.

Subjects include all soldiers evaluated in ASAP whose primary reason for referral was due to an alcohol-related problem (1983-2000). Only initial cases which occurred by 2000 were included in order to allow adequate follow-up time for the assessment of repeat DAMIS encounters (repeat alcohol-events).

We compared basic demographic characteristics of the study population to the general U.S. Army population. Several exploratory analyses and a decision to avoid potential bias related to the Persian Gulf War led us to choose a midpoint personnel file for comparison data of the Army at large to those referred to ASAP (the June 1990 personnel file). Demographics for the DAMIS population were taken from the closest DMDC personnel file to the date of initial intake in the DAMIS database. Demographic comparisons are reported in Table 2.

The data suggest that male soldiers are significantly more likely than female soldiers to be referred to ASAP with an alcohol related problem. There is a very strong inverse linear association between age and ASAP alcohol-encounter (chi square for linear trend = 37125.4, $p < .00001$) such that soldiers under age 21 are more than six times as likely as soldiers over the age of 40 to have an alcohol-related ASAP evaluation. Similarly, higher ranking enlisted soldiers and officers are at lower risk for an ASAP referral than lower ranking soldiers. Indian/Alaskan soldiers were 2.68 times as likely as black soldiers to be evaluated in ASAP, and white and Hispanics also had elevated odds of being evaluated than black soldiers (1.27 and 1.38, respectively). Married soldiers were at lower risk than single (never married) soldiers and soldiers with three or more dependents (usually a spouse and two children) were at lowest risk. Education was protective with successively higher levels of educational achievement associated with significantly less likelihood of ASAP alcohol-related encounter. Enlisted soldiers who are craftworkers, followed by those in infantry, electrical/mechanical equipment repair, healthcare, allied technical specialties, and communications/intelligence are at increased risk for alcohol-related ASAP encounter when compared to soldiers in support or administrative occupations. Officers in engineering and maintenance followed by tactical operations, then supply and procurement were at greatest risk when compared to healthcare officers.

Table 2. Comparison of demographic characteristics of soldiers referred for an ASAP evaluation to soldiers in the general Army population, 1983-2000.

Demographics	ASAP Study Population N= 260,249 (Col %)	General Army Population in June 1990 N = 794,486 (Col %)	OR	CI
Sex				
Male	246,202 (94.60%)	703,015 (88.49%)	2.29	2.25 – 2.33
Female	13,962 (5.36%)	91,315 (11.49%)	1.00	NA
Unknown	85 (0.03%)	156 (0.02%)	3.56	2.71 – 4.68
Age				

Demographics	ASAP Study Population N= 260,249 (Col %)	General Army Population in June 1990 N = 794,486 (Col %)	OR	CI
<21	67,045 (25.76%)	130,220 (16.39%)	6.23	6.03 – 6.44
21-25	114,001 (43.80%)	258,089 (32.49%)	5.35	5.17 – 5.52
26-30	42,204 (16.22%)	166,546 (20.96%)	3.07	2.97 – 3.17
31-35	21,409 (8.23%)	114,210 (14.38%)	2.27	2.19 – 2.35
36-40	11,217 (4.31%)	75,149 (9.46%)	1.81	1.74 – 1.88
>40	4,112 (1.58%)	49,765 (6.26%)	1.00	NA
Unknown	261 (0.10%)	507 (0.06%)	6.23	5.33 – 7.28
<i>Race/Ethnicity</i>				
White	175,639 (67.49%)	503,058 (63.32%)	1.27	1.25 – 1.28
African-American	62,096 (23.86%)	225,411 (28.37%)	1.00	N/A
Hispanic	11,102 (4.23%)	30,932 (3.89%)	1.38	1.27 – 1.33
Indian/Alaskan	3,149 (1.21%)	4,258 (0.54%)	2.68	2.56 – 2.81
Asian/Pacific	2,824 (1.09%)	12,834 (1.62%)	0.80	0.77 – 0.83
Other	5,413 (2.08%)	17,601 (2.22%)	1.12	1.08 – 1.15
Unknown	116 (0.04%)	392 (0.05%)	1.07	0.87 – 1.33
<i>Marital Status</i>				
Single	152,467 (58.59%)	310,726 (39.11%)	2.26	2.23 – 2.28
Married	98,391 (37.81%)	452,176 (56.91%)	1.00	NA
Widowed/Divorced/Legally Separated	7,022 (2.7%)	30,462 (3.83%)	1.06	1.03 – 1.09
Unknown	2,369 (0.91%)	1,122 (0.14%)	9.70	9.03 – 10.43
<i>Number of Dependents</i>				
Member only	152,742 (58.69%)	329,045 (41.42%)	1.80	1.77 – 1.82
Member + 1 dependent	36,050 (13.85%)	139,662 (17.58%)	1.00	NA
Member + 2 dependents	31,935 (12.27%)	123,172 (15.50%)	1.00	0.99 – 1.02
Member + 3 dependents	24,725 (9.50%)	124,657 (15.69%)	0.77	0.76 – 0.79
Member + 4 dependents	9,685 (3.72%)	52,873 (6.65%)	0.71	0.69 – 0.73
Member + 5-15 dependents	4,220	22,600	0.72	0.70 – 0.75

Demographics	ASAP Study Population N= 260,249 (Col %)	General Army Population in June 1990 N = 794,486 (Col %)	OR	CI
	(1.62%)	(2.84%)		
Unknown	892 (0.34%)	2,477 (0.31%)	1.40	1.29 – 1.51
<i>Education</i>				
< High School	12,874 (4.95%)	9,141 (1.15%)	24.29	23.41 – 25.21
High School Grad/GED/Alt. Educ.	229,633 (88.24%)	631,938 (79.54%)	6.27	6.11 – 6.43
Some College	9,242 (3.55%)	32,979 (4.15%)	4.83	4.67 – 5.00
≥College degree	6,431 (2.47%)	110,924 (13.96%)	1.00	NA
Unknown	2,069 (0.80%)	9,504 (1.20%)	3.75	3.56 – 3.96
<i>Rank</i>				
<u>Enlisted Personnel</u>	N = 255,246	N = 683,422		
E1-E4	193,933 (75.98%)	392,437 (57.42%)	3.34	3.27 – 3.41
E5-E6	50,355 (19.73%)	216,998 (31.75%)	1.57	1.53 – 1.60
E7-E9	10,931 (4.28%)	73,843 (10.80%)	1.00	NA
Enlisted Unknown	27 (0.01%)	144 (0.02%)	1.27	0.82 1.94
<u>Officers</u>	N = 5,003	N = 111,064		
Warrant Officer	1,189 (23.77%)	15,884 (14.30%)	2.60	2.18 – 3.10
O1 – O3	2,846 (58.89%)	61,019 (55.94%)	1.62	1.37 – 1.92
O4 – O5	806 (16.11%)	28,893 (26.01%)	0.97	0.81 – 1.16
O6 – O11	151 (3.02%)	5,244 (4.72%)	1.00	NA
Officer Unknown	11 (0.22%)	24 (0.02%)	15.92	7.18 – 34.71
<i>Occupation category</i>				
<u>Enlisted personnel</u>	N = 255,246	N = 683,422		
Infantry/Gun crew	79,675 (31.21%)	176,723 (25.86%)	1.65	1.62 – 1.67
Electronic Equipment repair	12,769 (5.00%)	33,447 (4.89%)	1.39	1.36 – 1.43
Communications/Intelligence	29,924 (11.72%)	94,793 (13.87%)	1.15	1.13 – 1.17
Health Care	15,719 (6.16%)	48,719 (7.13%)	1.18	1.15 – 1.20
Technical/Allied special	6,258 (2.45%)	19,685 (2.88%)	1.16	1.12 – 1.20
Support/Administrative	29,152 (11.42%)	106,435 (15.57%)	1.00	NA
Electrical/Mechanical	44,157	106,516	1.51	1.49 – 1.54

Demographics	ASAP Study Population N= 260,249 (Col %)	General Army Population in June 1990 N = 794,486 (Col %)	OR	CI
equipment repair	(17.30 %)	(15.59%)		
Crafts workers	7,078 (2.77%)	14,879 (2.18%)	1.74	1.68 – 1.79
Service/Supply	30,008 (11.76%)	79,218 (11.59%)	1.38	1.36 – 1.41
Non-occupational/Other	352 (0.14%)	2,630 (0.38%)	0.49	0.44 – 0.55
Enlisted Unknown	154 (0.06%)	377 (0.06%)	1.49	1.23 – 1.81
Officers	N = 5,003	N = 110,064		
General Officer/Executive	8 (0.16%)	428 (0.39%)	0.49	0.23 – 1.02
Tactical operations	1,944 (38.86%)	36,189 (32.58%)	1.41	1.29 – 1.55
Intelligence Officer	218 (4.36%)	5,495 (4.95%)	1.04	0.89 – 1.23
Engineering & Maintenance Officer	708 (14.15%)	12,581 (11.33%)	1.48	1.33 – 1.66
Scientists & Professionals	137 (2.74%)	5,746 (5.17%)	0.63	0.52 – 0.76
Health Care Officer	641 (12.81%)	16,880 (15.20%)	1.00	NA
Administrator	324 (6.48%)	7,622 (6.86%)	1.12	0.97 – 1.29
Supply, Procurement, Allied Officer	407 (8.14%)	8,771 (7.90%)	1.22	1.07 – 1.39
Non-occupational/Other	597 (11.93%)	17,242 (15.52%)	0.91	0.81 – 1.02
Officer Unknown	19 (0.38%)	110 (0.10%)	4.55	2.69 – 7.61
Warrant Officer Unknown	--	--	--	--

Between 1983 and 2003, the number of enlisted women in the Army has risen approximately 58%, from 9.85% to 15.57% (TAIHOD data). We hypothesized that the changing gender composition of the Army over time might also affect the gender composition of those referred for an alcohol evaluation. We explored the potential effect of these factors in the following graph (Figure 7), which shows the differences in proportion of ASAP alcohol referrals among male and female soldiers overtime along side of the changing gender distribution of the entire Army 1983-2000.

As this graph illustrates, the demographic profile of the entire Army has shifted with the proportion of female soldiers increasing from about 10%, at the beginning of the study period, to 15% near the end of the study period. Soldiers referred to the ASAP over the entire study period were more likely to be male than are soldiers in the general Army population. The data suggest that the gender differential in alcohol referrals may be growing. That is, while the overall proportion of men in the general Army decreased over time (from about 90% to 85%) the percentage of males evaluated for alcohol in ASAP decreased more slowly (96% to 92%). This is consistent with other studies that

have found higher rates of alcohol abuse among men (13) though it is unclear why the relative proportion of men referred to ASAP appears to be increasing over time.

Figure 7. Gender composition of soldiers evaluated for an alcohol-related problem in the ASAP compared to the general U.S. Army population, 1983-2000.

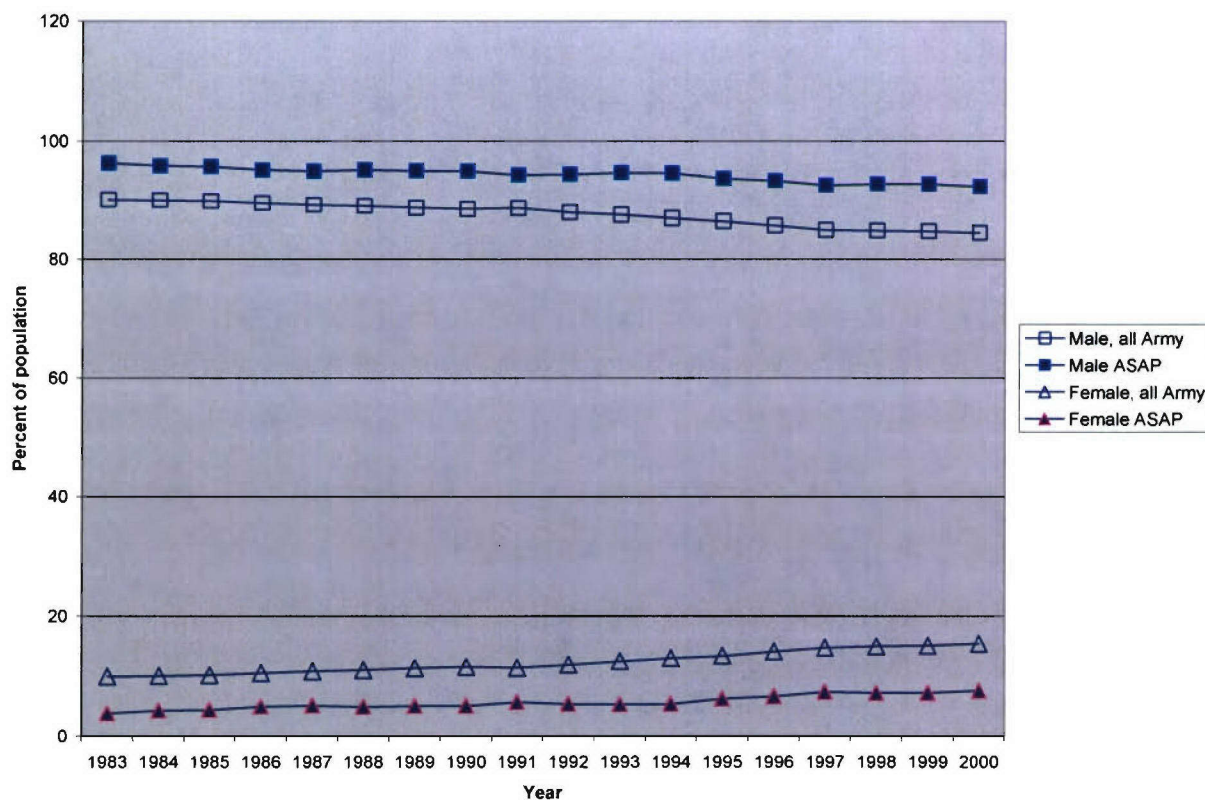
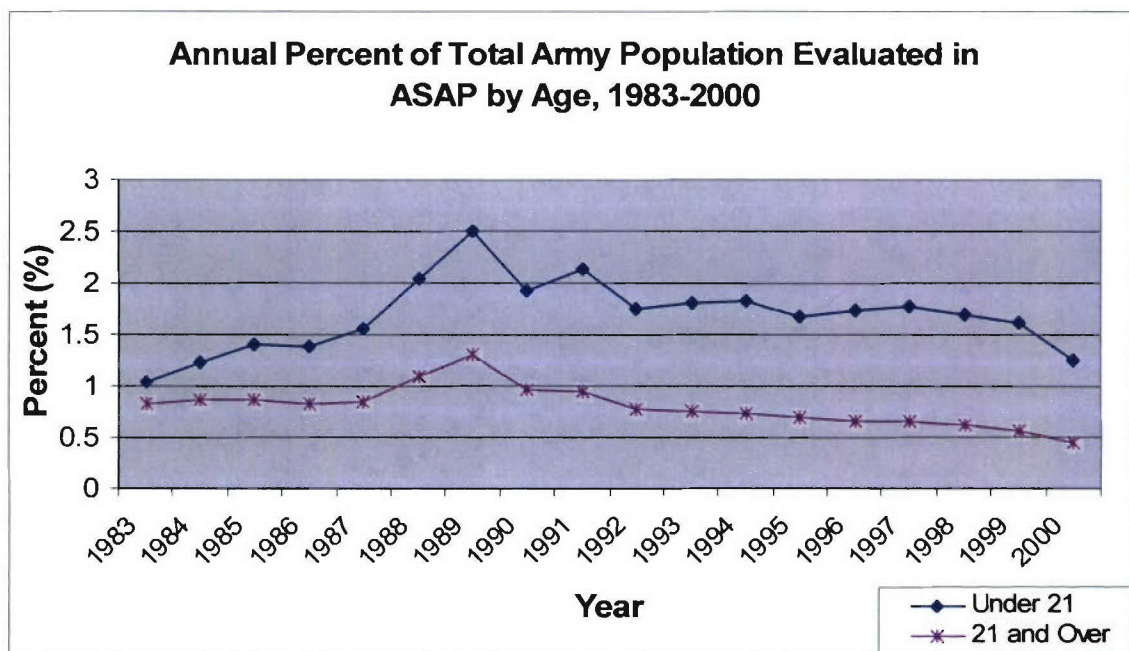


Figure 8 explores potential temporal effects with respect to age throughout our study period. Based on observed declines in alcohol-related hospitalizations and concomitant changes in Army and national alcohol policies such as changes in the minimum legal drinking age (MLDA) we hypothesized that there would be fewer alcohol-related ASAP events over time but the decline in alcohol-related problems might not occur uniformly over all age groups. Specifically, we expected that changes in the MLDA occurring in the 1980s would result in increased alcohol-case finding among those under the age of 21. As we hypothesized, there were increases in the relative proportion of ASAP alcohol referrals among soldiers under the age of 21 beginning in the mid to late 1980s, when MLDA laws were being changed to 21 in most states and in U.S. military installations.

Figure 8. Percent of Total Army Population under age 21 and 21+ Who Were Evaluated in ASAP, 1983-2000.



In addition to exploring the demographic profile of soldiers referred to ASAP for alcohol problems, we also examined method of referral ("case finding") as well as disposition including whether or not the referred soldier was ultimately enrolled for treatment or not and, if not, the reason why he or she was not enrolled. Referral for an alcohol evaluation might be initiated in a number of ways including command referral, medical referral, self referral, legal or other investigation, family member, etc. This information will be used to examine associations between referral mechanism and enrollment as well as associations with repeat referrals and alcohol-related evaluations. We will also examine outcomes for soldiers referred to ASAP for evaluation but ultimately not enrolled as well as the reason why they were not enrolled. These soldiers will be followed to assess risk for subsequent alcohol-related event. We will also

explore reason for non-enrollment (e.g., patient refused services, commander decided not to enroll the soldier, determination made that the soldier did not actually have a drinking problem) and associations with subsequent alcohol-related events. This may allow us to determine whether or not certain non-enrollment decisions were misguided.

The three most common methods of case identification were referral by a Commander or Supervisor (31.17% of all intake records; N = 81,132), investigation or apprehension (25.42% of all intake files; N = 66,148) and self referral (21.69% of all intake files; N=56,452). Other methods by which soldiers were referred to ASAP included medical referral (10.94%), referral after a Driving under intoxication (DUI) charge 6.77%), and referral after a security clearance check (0.13%).

Among the population of 260,249 soldiers evaluated in ASAP with a completed DAMIS intake file, 190,109 (73.05%) were enrolled into the substance abuse treatment program. Though not followed in the ASAP treatment program, the majority of those not enrolled, (65.5%, N = 45,920), were referred to the Alcohol and Drug Abuse Prevention Training (ADAPT) course. This course is designed to educate soldiers about substance abuse including the behavioral, psychological and physiological aspects of substance abuse. Army regulations require the ADAPT course to be no less than 12 hours (1) (3). The ASAP evaluator might opt to refer soldiers to this training when he or she felt that soldier did not have a severe enough alcohol problem to warrant treatment but would benefit from alcohol abuse prevention training. Twenty percent of those not enrolled (N=14,047) were determined, after assessment, to not have a substance abuse problem and 6,515 (9.2%) were not enrolled because the commander decided against it. Other reasons for non-enrollment subsequent to referral for evaluation of an alcohol problem included referral to resources for reasons other than alcohol or drug abuse, such as family counseling or other mental health services (N = 2,644; 3.8%); refusal of services by the patient (N = 980; 1.4%); or, in a very few cases (N = 34; .05%), non-enrollment because the reviewing medical officer determined that the soldier's urinalysis result was a false positive or related to the use of legal, prescribed medication (3).

Related Tasks: SSDS SOW 5
SSDS SOW 6
SSDS SOW 9

V. Alcohol abuse as a predictor of death

We have planned and initiated a retrospective cohort study assessing alcohol abuse and subsequent risk for injury-related death. Soldiers identified in the DAMIS database with an alcohol-related problem, as measured by enrollment in ASAP, will be followed over time to assess increased risk of injury-death.

We hypothesize that soldiers evaluated in ASAP for an alcohol condition and subsequently enrolled in ASAP will be at increased risk for injury death and may be particularly likely to die of particular types of injury deaths often associated with drinking, such as motor vehicle crashes, suicide and homicides. While enrollment in ASAP indicates that an alcohol problem was identified and that some form of treatment was offered, the effectiveness of care is unknown. It is possible that some soldiers treated in ASAP continue high-risk drinking, placing them at increased risk for injury death while

intoxicated. It is also possible that factors associated with heavy drinking, binge drinking, and other alcohol problems are also associated with increased likelihood of injury due to covariance with factors such as increased risk taking, impulsivity, aggression, or depression even when not acutely intoxicated. Thus, association between ASAP enrollment and increased injury deaths could be due to a direct effect (more likely to be intoxicated) or an indirect association through a third variable.

The study population comprises all active duty Army soldiers with at least one alcohol-related ASAP enrollment between January 1, 1983 and December 31, 1998. These "exposed," or "at-risk," soldiers will be compared to soldiers who were never enrolled in ASAP but were on active duty during the same time in which the exposed soldier was referred to ASAP. Since a soldier can be evaluated or enrolled in ASAP multiple times, we will begin follow up at the first enrollment. Subsequent repeat enrollments and evaluations may be used as indicator variables in the models. Subjects will be followed through 2003 in order to evaluate whether or not they face increased risk for an injury-related death and, if so, to determine whether the increased risk declines, increases or remains stable over time following initial referral to ASAP.

Preliminary analysis revealed that 181,053 soldiers had an initial ASAP evaluation for alcohol that resulted in an ASAP enrollment between January 1, 1983 and December 31, 1998. In this same time period there were 10,635 active duty Army soldier deaths. Of these, 8,708 of the deaths were due to injury.

Related Tasks: SSDS SOW 3
SSDS SOW 6
SSDS SOW 9

VI. Trends in Injury Hospitalizations

We have also begun analysis of injury hospitalizations over time. Missing TRICARE data have slowed progress but some exploratory analyses have been done and the analytic plans and models are being developed. These will be applied to the new data once they are available. The goal of this paper is to describe long range trends in Army injury-related hospitalization rates with and without an alcohol-related secondary diagnosis. Because Army hospital data, unlike civilian data, include very complete cause of injury coding, including intentionality, we will also explore long-term trends in rates for intentional and unintentional injury hospitalization as well as concomitant alcohol diagnosis (6, 7). We will also explore specific causes of intentional injury over time and look at changes in relative rates of suicide/self-inflicted, versus assault and the relative proportion of events that involve alcohol as a secondary diagnosis.

Related Tasks: SSDS SOW 5
SSDS SOW 7
SSDS SOW 8

Summary Status of SOW Progress

Legend: ✓ = Complete □ = Initiated Δ = Not yet initiated

SOW#	Task	Status	Section(s)/Reference
1	Hire staff, obtain and link data, error check, human use review stuff	✓	Annual Report, 2004
2	Identify cases with alcohol diagnoses in the hospital discharge data. Calculate incidence and prevalence rates of alcohol diagnoses as both principle and secondary diagnoses	□	Annual Report, 2004 I. II.
3	Develop linkage between cases in hospitalization databases; obtain, analyze, and link data from mortality databases with hospitalization records.	✓	Annual Report, 2004 I. II. V.
4	Begin preparation of paper on the prevalence of alcohol diagnoses in the Army.	✓	Annual Report, 2004 II. III.
5	Prepare the first series of papers describing the epidemiology of alcohol diagnoses and injuries in the Army.	✓	Annual Report, 2004 II. III. IV. VI.
6	Initiate detailed analytic studies using linked hospitalization, mortality and other military databases, compare injury risk in women to rates in men by occupation and other variables, for those with and without alcohol diagnoses.	✓	IV. V.
7	Initiate cohort study of recurrent injury in relation to alcohol use.	✓	VI.
8	Compare the distribution of injuries in those with and without alcohol diagnoses.	□	VI.
9	Explore linkage with other military databases such as safety center, disability data, and outpatient data.	✓	I. IV. V.
10	Complete papers on the distribution of injuries.	Δ	N/A
11	Complete detailed analytic studies begun in Year 2 of specific types of injuries.	Δ	N/A
12	Complete cohort studies of alcohol problems and injury risk studies begun in Year 2.	Δ	N/A
13	Develop final estimates of the risk of injury associated with alcohol diagnoses; deaths and hospitalized injuries.	Δ	N/A
14	Analyze outpatient data and replicate models using these data.	Δ	N/A

15	Prepare final report and manuscripts describing study findings, define future research areas, and develop recommendations for interventions to reduce alcohol-related injuries in the military.	Δ	N/A
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Additional Grant Related Activities Completed in Year 3

On September 14, 2004, we submitted a summary report of findings and efforts under this project as well as a request for Continuing Review for our study protocol with the USARIEM Human Use Review Committee (HURC). We received approval following their review on October 6, 2004. A copy of the Continuing Review is attached to this report in Appendix B.

KEY RESEARCH ACCOMPLISHMENTS

Located and obtained hospitalization data for active duty Army soldiers in non-Army MTFs. This information is crucial to all analyses in order to report accurate counts of hospitalizations.

Made significant progress towards acquiring inpatient hospitalization records for active duty Army soldiers treated in civilian facilities after the introduction of TRICARE in 1996.

Successfully cleaned several databases (i.e. Pay and Compensation files, DAMIS files) and linked them to the TAIHOD for future analyses.

Performed new analyses with more complete data to illustrate patterns in known transfer cases where sequential hospital records actually constitute a single episode of care. This has informed plans for refining analyses of inpatient data to be completed once we have missing TRICARE records.

Linked DAMIS data to the TAIHOD in order to explore demographic characteristics and patterns of substance abuse treatment for soldiers referred to and treated within the ASAP.

Prepared and made significant progress on a paper looking at the descriptive epidemiology of soldiers referred for evaluation the first-time to the Army substance abuse treatment program.

Standardized civilian alcohol abuse rates to the military population by age, race and gender.

Prepared and drafted a paper comparing alcohol diagnoses hospitalization rates between the U.S. Army and the U.S. civilian populations between 1980 -1995.

Initiated study and produced preliminary findings relating alcohol abuse to injury death.

Initiated study and produced preliminary findings on trends in injury hospitalizations, with and without alcohol secondary diagnoses.

CONCLUSIONS

1. Soldiers who were enrolled in substance abuse programs for alcohol-related reasons were more likely to be white, male, and young (18-25), of lower rank (E1-E4) and were less well-educated than the military population as a whole. These characteristics are similar to those found among alcohol abuse patients in the civilian population (15).
2. Rates for Army alcohol-related hospitalizations were higher than civilian rates through most of the 1980s; this trend began to reverse in the early 1990s. This pattern appears to be driven largely by a drop in the number of nondependent alcohol abuse cases among military personnel. Possible reasons for this observation include: increased screening for drugs and alcohol abuse in the Army, improvements in alcohol abuse prevention and treatment programs, changes in policies regarding tolerance of substance abuse in military personnel, demographic shifts in the Army population towards older and increasing numbers of female soldiers; fewer inpatient alcohol cases due to changing patterns of treatment, the advent of managed care, and the availability of more outpatient treatment programs within the military.
3. Army rates for severe alcohol-related disorders such as, alcohol psychosis, and alcohol-related liver disorders, have been consistently lower than those observed in the civilian population. Again, this may be due to a combination of factors, including pre-enlistment screening for substance abuse, low tolerance of severe substance abuse in the military, and health or legal problems that would render those with serious alcohol problems unfit for military service.
4. Times between initial hospitalization and transfer to another facility to continue care vary by diagnostic category and by subgroups within categories. This finding may be the result of variations in the severity of a condition or differences in the treatment protocol for acute versus more chronic conditions associated with different types of broadly defined conditions. The availability of appropriate hospital treatment programs may also vary by condition, resulting in continuation of care delays for some conditions and rapid transfers for others. This finding also suggests that efforts to accurately count unique events, must consider both the diagnosis as well as the time between events.
5. Researchers that use large, administrative military hospital databases must use caution in using and interpreting data. Data collected for purposes other than research may be incomplete or insufficient for use in epidemiological studies.

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LIST OF APPENDICES

Appendix A – Crosswalk of Alcohol-related Diagnoses used by U.S. Army hospitals
1980 – Present.

Appendix B – Approved Continuing Review for USARIEM No. H00-10j “Preventing the
consequences of alcohol abuse: identification of soldiers at high risk for fatal and
serious injuries.” October 2004.

Appendix A

ALCOHOL CODES USED BY THE MILITARY BETWEEN 1980-PRESENT

Group 1. Drug/Alcohol Combo:

1980-1985	1986-1988
303.1 – Alcohol dependence with drug abuse	303.07 – Alcohol dependence syndrome – acute alcohol intoxication, with single drug use
303.10 – Alcohol dependence with drug abuse, unspecified	303.08 – Alcohol dependence syndrome – acute alcohol intoxication, with multiple drug use
303.11 – Alcohol dependence with drug abuse, continuous/habitual	303.97 – Alcohol dependence syndrome – other and unspecified alcohol dependence, with single drug use
303.12 – Alcohol dependence with drug abuse, episodic	303.98 – Alcohol dependence syndrome – other and unspecified alcohol dependence, with multiple drug use
304.2A – Single-drug dependence – opium, opium alkaloids, and their derivatives, with alcohol	304.04 – Opioid type dependence, with alcohol
304.2B – Single-drug dependence – synthetic analgesics with morphine-like effects, with alcohol	304.14 – Barbituate and similarly acting sedative or hypnotic dependence, with alcohol
304.2C – Single-drug dependence – barbiturates, with alcohol	304.24 – Cocaine dependence, with alcohol
304.2D – Single-drug dependence – other hypnotics and sedatives or tranquilizers, with alcohol	304.34 – Cannabis dependence, with alcohol
304.2E – Single-drug dependence – cocaine, with alcohol	304.44 – Amphetamine and other psychostimulant dependence, with alcohol
304.2F – Single-drug dependence – cannabis sativa, with alcohol	304.54 – Hallucinogen dependence, with alcohol
304.2G – Single-drug dependence – other psycho-stimulants, with alcohol	304.64 – Other specified drug dependence, with alcohol
304.2H – Single-drug dependence – hallucinogens, with alcohol	304.74 – Combinations of opioid type drug with any other, with alcohol
304.2K – Single-drug dependence – other, with alcohol	304.84 – Combinations of drug dependence excluding opioid type drug, with alcohol
304.2L – Single-drug dependence – unspecified, with alcohol	304.94 – Unspecified drug dependence, with alcohol
304.2M – Single-drug dependence – methaqualone (Mandrax), with alcohol	305.07 – Nondependent abuse of drugs – alcohol abuse, with single drug use
304.2N – Single-drug dependence – Phencyclidine/PCP (angel dust), with alcohol	305.08 – Nondependent abuse of drugs – alcohol abuse, with multiple drug use
304.3A – Polydrug dependence – opium, opium alkaloids, and their derivatives, with alcohol	305.14 – Nondependent abuse of drugs - tobacco use disorder, with alcohol
304.3B – Polydrug dependence – synthetic analgesics with morphine-like effects, with alcohol	305.16 – Nondependent abuse of drugs - tobacco use disorder, multiple drug use, with alcohol
304.3C – Polydrug dependence – barbiturates, with alcohol	305.24 – Nondependent abuse of drugs - cannabis abuse, with alcohol
304.3D – Polydrug dependence – other hypnotics and sedatives or tranquilizers, with alcohol	305.26 – Nondependent abuse of drugs - cannabis abuse, multiple drug use, with alcohol
304.3E – Polydrug dependence – cocaine, with alcohol	305.34 – Nondependent abuse of drugs - hallucinogen abuse, with alcohol
304.3F – Polydrug dependence – cannabis sativa, with alcohol	305.36 – Nondependent abuse of drugs - hallucinogen abuse, multiple drug abuse, with alcohol
304.3G – Polydrug dependence – other psycho-stimulants, with	305.44 – Nondependent abuse of drugs – barbiturate and

alcohol	similarly acting sedative or hypnotic abuse, with alcohol
304.3H – Polydrug dependence – hallucinogens, with alcohol	305.46 - Nondependent abuse of drugs – barbiturate and similarly acting sedative or hypnotic abuse, multiple drug use, with alcohol
304.3K – Polydrug dependence – other, with alcohol	305.54 – Nondependent abuse of drugs – opioid abuse, with alcohol
304.3L – Polydrug dependence – unspecified, with alcohol	305.56 - Nondependent abuse of drugs – opioid abuse, multiple drug use, with alcohol
304.3M – Polydrug dependence – methaqualone (Mandrax), with alcohol	305.64 - Nondependent abuse of drugs – cocaine abuse, with alcohol
304.3N – Polydrug dependence – Phencyclidine/PCP (angel dust), with alcohol	305.66 - Nondependent abuse of drugs – cocaine abuse, multiple drug use, with alcohol
305.2A – Single-drug nondependent abuse – opium, opium alkaloids, and their derivatives, with alcohol	305.74 – Nondependent abuse of drugs – amphetamine or related acting sympathomimetic abuse, with alcohol
305.2B – Single-drug nondependent abuse – synthetic analgesics with morphine-like effects, with alcohol	305.76 – Nondependent abuse of drugs – amphetamine or related acting sympathomimetic abuse, multiple drug use, with alcohol
305.2C - Single-drug nondependent abuse – barbiturates, with alcohol	305.84 – Nondependent abuse of drugs – antidepressant type abuse, with alcohol
305.2D - Single-drug nondependent abuse – other hypnotics and sedatives or tranquilizers, with alcohol	305.86 - Nondependent abuse of drugs – antidepressant type abuse, multiple drug use, with alcohol
305.2E – Single-drug nondependent abuse – cocaine, with alcohol	305.94 – Nondependent abuse of drugs – other or unspecified drug abuse, with alcohol**
305.2F – Single-drug nondependent abuse – cannabis sativa, with alcohol	305.96 - Nondependent abuse of drugs – other or unspecified drug abuse, multiple drug use, with alcohol**
305.2G – Single-drug nondependent abuse – other psycho-stimulants, with alcohol	
305.2H – Single-drug nondependent abuse – hallucinogens, with alcohol	
305.2K – Single-drug nondependent abuse – other, with alcohol	
305.2L – Single-drug nondependent abuse – unspecified, with alcohol	
305.2M – Single-drug nondependent abuse – methaqualone (Mandrax), with alcohol	
305.2N – Single-drug nondependent abuse – Phencyclidine/PCP (angel dust), with alcohol	
305.3A – Polydrug nondependent abuse – opium, opium alkaloids, and their derivatives, with alcohol	
305.3B – Polydrug nondependent abuse – synthetic analgesics with morphine-like effects, with alcohol	
305.3C - Polydrug nondependent abuse – barbiturates, with alcohol	
305.3D - Polydrug nondependent abuse – other hypnotics and sedatives or tranquilizers, with alcohol	
305.3E – Polydrug nondependent abuse – cocaine, with alcohol	
305.3F – Polydrug nondependent abuse – cannabis sativa, with alcohol	
305.3G – Polydrug nondependent abuse – other psycho-stimulants, with alcohol	
305.3H – Polydrug nondependent abuse – hallucinogens, with alcohol	
305.3K – Polydrug nondependent abuse – other, with alcohol	
305.3L – Polydrug nondependent abuse – unspecified, with alcohol	

305.3M – Polydrug nondependent abuse – methaqualone (Mandrax), with alcohol	
305.3N – Polydrug nondependent abuse – Phencyclidine/PCP (angel dust), with alcohol	
305.5 Alcohol nondependent abuse, with drug	

After 1988, include any hospitalization that has both an alcohol and a drug diagnosis as a combo case. Drug codes to look for include the following:

*NOTE: does not include tobacco dependence

1989-Present
304.00 - Drug dependence-opioid type dependence, unspecified
304.01 - Drug dependence-opioid type dependence, continuous
304.02 - Drug dependence-opioid type dependence, episodic
304.03 - Drug dependence-opioid type dependence, in remission
304.10 - Drug dependence-barbiturate or similarly acting sedative or hypnotic type dependence, unspecified
304.11 - Drug dependence- barbiturate or similarly acting sedative or hypnotic type dependence, continuous
304.12 - Drug dependence- barbiturate or similarly acting sedative or hypnotic type dependence, episodic
304.13 - Drug dependence- barbiturate or similarly acting sedative or hypnotic type dependence, in remission
304.20 - Drug dependence-cocaine dependence, unspecified
304.21 - Drug dependence-cocaine dependence, continuous
304.22 - Drug dependence-cocaine dependence, episodic
304.23 - Drug dependence-cocaine dependence, in remission
304.30 - Drug dependence-cannabis dependence, unspecified
304.31 - Drug dependence-cannabis dependence, continuous
304.32 - Drug dependence-cannabis dependence, episodic
304.33 - Drug dependence-cannabis dependence, in remission
304.40 - Drug dependence-amphetamine and other psychostimulant dependence, unspecified
304.41 - Drug dependence-amphetamine and other psychostimulant dependence, continuous
304.42 - Drug dependence-amphetamine and other psychostimulant dependence, episodic
304.43 - Drug dependence-amphetamine and other psychostimulant dependence, in remission
304.50 - Drug dependence-hallucinogen dependence, unspecified
304.51 - Drug dependence-hallucinogen dependence, continuous
304.52 - Drug dependence-hallucinogen dependence, episodic
304.53 - Drug dependence-hallucinogen dependence, in remission
304.60 - Drug dependence-other specified drug dependence, unspecified
304.61 - Drug dependence-other specified drug dependence, continuous
304.62 - Drug dependence-other specified drug dependence, episodic
304.63 - Drug dependence-other specified drug dependence, in remission
304.70 - Drug dependence-combinations of opioid type drug with any other, unspecified
304.71 - Drug dependence-combinations of opioid type drug with any other, continuous
304.72 - Drug dependence-combinations of opioid type drug with any other, episodic
304.73 - Drug dependence-combinations of opioid type drug with any other, in remission
304.80 - Drug dependence-combinations of drug dependence excluding opioid type drug, unspecified
304.81 - Drug dependence-combinations of drug dependence excluding opioid type drug, continuous
304.82 - Drug dependence-combinations of drug dependence excluding opioid type drug, episodic
304.83 - Drug dependence-combinations of drug dependence excluding opioid type drug, in remission
304.90 - Drug dependence-unspecified drug dependence, unspecified
304.91 - Drug dependence-unspecified drug dependence, continuous
304.92 - Drug dependence-unspecified drug dependence, episodic
304.93 - Drug dependence-unspecified drug dependence, in remission
305.20 – Nondependent abuse of drugs-cannabis abuse, unspecified

305.21 – Nondependent abuse of drugs-cannabis abuse, continuous
305.22 – Nondependent abuse of drugs-cannabis abuse, episodic
305.23 – Nondependent abuse of drugs-cannabis abuse, in remission
305.30 – Nondependent abuse of drugs-hallucinogen abuse, unspecified
305.31 – Nondependent abuse of drugs- hallucinogen abuse, continuous
305.32 – Nondependent abuse of drugs- hallucinogen abuse, episodic
305.33 – Nondependent abuse of drugs- hallucinogen abuse, in remission
305.40 – Nondependent abuse of drugs-barbiturate and similarly acting sedative or hypnotic abuse, unspecified
305.41 – Nondependent abuse of drugs-barbiturate and similarly acting sedative or hypnotic abuse, continuous
305.42 – Nondependent abuse of drugs-barbiturate and similarly acting sedative or hypnotic abuse, episodic
305.43 – Nondependent abuse of drugs-barbiturate and similarly acting sedative or hypnotic abuse, in remission
305.50 – Nondependent abuse of drugs-opioid abuse, unspecified
305.51 – Nondependent abuse of drugs-opioid abuse, continuous
305.52 – Nondependent abuse of drugs-opioid abuse, episodic
305.53 – Nondependent abuse of drugs-opioid abuse, in remission
305.60 – Nondependent abuse of drugs-cocaine abuse, unspecified
305.61 – Nondependent abuse of drugs-cocaine abuse, continuous
305.62 – Nondependent abuse of drugs-cocaine abuse, episodic
305.63 – Nondependent abuse of drugs-cocaine abuse, in remission
305.70 – Nondependent abuse of drugs-amphetamine or related acting sympathomimetic abuse, unspecified
305.71 – Nondependent abuse of drugs-amphetamine or related acting sympathomimetic, continuous
305.72 – Nondependent abuse of drugs-amphetamine or related acting sympathomimetic abuse, episodic
305.73 – Nondependent abuse of drugs-amphetamine or related acting sympathomimetic abuse, in remission
305.80 – Nondependent abuse of drugs-antidepressant type abuse, unspecified
305.81 – Nondependent abuse of drugs-antidepressant type abuse, continuous
305.82 – Nondependent abuse of drugs-antidepressant type abuse, episodic
305.83 – Nondependent abuse of drugs-antidepressant type abuse, in remission
305.90 – Nondependent abuse of drugs-other, mixed, or unspecified drug abuse, unspecified
305.91 – Nondependent abuse of drugs-other, mixed, or unspecified drug abuse, continuous
305.92 – Nondependent abuse of drugs-other, mixed, or unspecified drug abuse, episodic
305.93 – Nondependent abuse of drugs-other, mixed, or unspecified drug abuse, in remission

Group 2. Alcohol Psychosis:

1980-Present	1996-Present
291.0 Delirium tremens	
291.1 Korsakoff's psychosis, alcoholic	
291.2 Other alcoholic dementia	
291.3 Other alcoholic hallucinosis	
291.4 Pathological drunkenness	
291.5 Alcoholic jealousy	
291.8 Other specified alcoholic psychosis	
	291.81 Alcohol withdrawal
	291.89 Other specified alcohol psychosis
291.9 Unspecified alcoholic psychosis	

Group 3: Alcohol Dependence Syndrome (excludes dual abuse with drugs):

1980-Present	1986-present	1992-present
303.0 – Acute alcohol intoxication		

303.00 Alcohol dependence unspecified		
303.01 Alcohol dependence syndrome , continuous/habitual		
303.02 Alcohol dependence syndrome, episodic		
	303.03 Acute Alcohol intoxication - in remission	
	303.90 Other and unspecified alcohol dependence - Unspecified	
	303.91 Other and unspecified alcohol dependence - Continuous	
	303.92 Other and unspecified alcohol dependence - Episodic	
	303.93 Other and unspecified alcohol dependence - In remission	
357.5 Alcoholic polyneuropathy		
425.5 Alcoholic cardiomyopathy		
535.3 Alcoholic gastritis **ends in 1992		
		535.30 alcoholic gastritis with hemorrhage
		535.31 alcoholic gastritis without hemorrhage

Group 4: Nondependent abuse of alcohol (excludes dual abuse with drugs):

1980-1985	1986 - Present
305.4 – Alcohol, nondependent abuse	
	305.0 - Nondependent abuse of drugs - alcohol Abuse
	305.00 - Nondependent abuse of drugs - alcohol abuse - unspecified
	305.01 - Nondepent abuse of drugs - alcohol abuse - continuous
	305.02 - Nondepent abuse of drugs - alcohol abuse - episodic
	305.03 - Nondepent abuse of drugs - alcohol abuse – in remission

Group 5: Chronic Liver disease and cirrhosis

1980-Present
571.0 Alcoholic fatty liver
571.1 Acute alcoholic hepatitis
571.2 Alcoholic cirrhosis of liver
571.3 Alcoholic liver damage, unspecified
571.5 Cirrhosis of liver without mention of alcohol
571.6 Biliary cirrhosis
571.8 Other chronic nonalcoholic liver disease
571.9 Unspecified chronic liver disease without mention of alcohol

Group 6: Other Alcohol-related Conditions:

1980-present
760.71 Alcohol affecting fetus via placenta or breast milk

790.3	Excessive blood level of alcohol
977.3	Poisoning by Alcohol deterrents
980.0	Toxic effect of ethyl alcohol
980.1	Toxic effect of methyl alcohol
980.2	Toxic effect of isopropyl alcohol
980.8	Toxic effect of other specified alcohols
980.9	Toxic effect of unspecified alcohol
V11.3	- Personal history of alcoholism
V79.1	Screening for Alcoholism
E947.3	Adverse effects of Alcohol deterrents

Appendix B

USARIEM Human Use Review Committee
CONTINUING REVIEW REPORT

In accordance with Federal Regulations 45CFR46, the Human Use Review Committee must review protocols at least annually or more frequently to approve human subject involvement. Please complete this form and return to ORQC.

Protocol Number: USARIEM H00-10j HSRRB No. A 10709 Date 14 September 2004

INITIAL HURC REVIEW DATE 21 November 2002

Principal Investigator Dr. Nicole Bell

Title: Preventing the Consequences of Alcohol Abuse: Identification of Soldiers at High Risk for Fatal and Serious Injuries

PROTOCOL SUMMARY: 100 words

The main objective of this three-year study is to improve the understanding of long-term consequences of alcohol problems on injury risk in order to prevent further injuries. The first phase of this project is a cross-sectional study to determine the prevalence of alcohol-related diagnoses among hospitalized active-duty Army soldiers. The second phase uses a retrospective cohort design to follow patients with alcohol-related diagnoses over time to determine whether their injury risk is higher than that of the general population.

1. Number of VOLUNTEERS REQUESTED in the approved protocol: Total Army population eligible
2. USE of VOLUNTEERS:

x CONTINUING
 COMPLETED on _____
3. If use of volunteers is neither completed nor actively underway, state reason for the interruption. When is study scheduled for completion? N/A
4. Please complete the following table:

	Number of volunteers
VOLUNTEERS INITIATED into the study ¹	261,523
VOLUNTEERS WITHDRAWN or withdrew ²	0
VOLUNTEERS COMPLETING testing to date	0

¹Include those now being tested, and any who withdrew or were withdrawn

² Include volunteers who withdrew or were withdrawn

Our number of volunteers has changed since our last Continuing Review accepted 16 October 2003 and signed by the Commander 29 October 2003. This is due to additional analyses now underway authorized by study protocol. This new number of participants represents the combined study population from all projects within this protocol.

5. List and briefly describe all ADVERSE EVENTS: N/A
6. New developments or publications influencing volunteer participation or risk
Summarize the new development(s) and/or reference literature source and title. N/A

7. List AMENDMENTS made to the research since the LAST REVIEW: N/A
8. List DEVIATIONS occurred during research since the LAST REVIEW: N/A
9. Are the research files and laboratory notebook being maintained in accordance with USARIEM-Memo 70-25 and 70-55: N/A
10. Are the files and laboratory notebook ready for periodic review? N/A

Where is data stored, if laboratory notebook is not use?

11. Use a separate SHEET TO SUMMARIZE FINDINGS reported to date


On 30 July 2004, a courtesy copy of our annual report to USAMRAA was delivered to the HURC Chair and the MPD Division Chief. This report details all progress in the past year according to out stated objectives. A copy of this report is attached to this review.


12. List PUBLICATIONS, PRESENTATIONS, and ABSTRACTS resulting from this study.

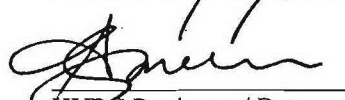
Benjamin KL, Hollander IE, Toboni H, Bell NS. **Measuring hospital episodes of care for use in alcohol and injury epidemiological studies.** Presented at Department of Defense, Peer Reviewed Medical Research Program (PRMRP) Investigators Meeting. Puerto Rico: April 26-28, 2004 (Abstract).

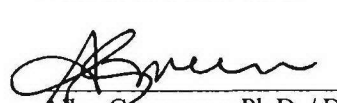
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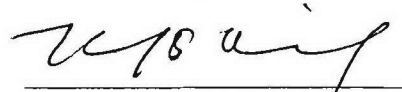
Copy of CURRENT SIGNED PRIVILEGE REVIEW SHEET
Copy of 30 JULY 2004 ANNUAL REPORT

 9/14/2004
Nicole Bell, ScD, MPH / Date

 9/14/2004
Edward J. Zambraski, PhD / Date

 9/22/04
HURC Reviewer / Date

 9/22/04
Allen Cymerman, Ph.D. / Date
HURC Chair

 10/6/04
KARL E. FRIEDL, COL, MS Date
USARIEM Commander